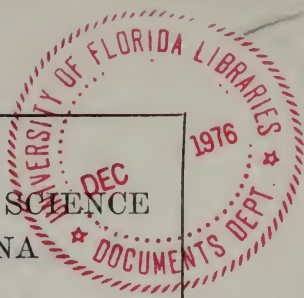


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[COMMITTEE PRINT]



ANNOTATED BIBLIOGRAPHY ON SCIENCE
AND TECHNOLOGY IN CHINA

SCIENCE AND TECHNOLOGY IN THE
PEOPLE'S REPUBLIC OF CHINA
BACKGROUND STUDY NO. 1

PREPARED FOR THE
SUBCOMMITTEE ON
DOMESTIC AND INTERNATIONAL
SCIENTIFIC PLANNING AND ANALYSIS
OF THE
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SCIENCE AND TECHNOLOGY
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LETTER OF TRANSMITTAL

HOUSE OF REPRESENTATIVES,
COMMITTEE ON SCIENCE AND TECHNOLOGY,
Washington, D.C., September 2, 1976.

HON. OLIN E. TEAGUE,
*Chairman, Committee on Science and Technology,
House of Representatives, Washington, D.C.*

DEAR MR. CHAIRMAN: I am transmitting herewith an annotated bibliography on science and technology in China. This bibliography covers the period 1970 to date and provides a useful overview of the current state and recent trends in science and technology in China.

Although the United States and China are countries with vast differences in history, political systems, and industrial development, we have in recent years seen a gradual broadening in scientific and technological exchanges between our two countries. Beginning with the visit of the President of the United States to the People's Republic of China in February 1972, American and Chinese scientists and engineers have increasingly visited each other's countries. To fully understand the impact on American science and on the future relations between our two countries, we must understand more about science and technology in China. It is my hope that this modest bibliography will contribute toward this end.

The report was prepared for the Committee by the Library of Congress. Ms. Claire Geier with the assistance of Ms. Karen Guarisco, both of the Science Policy Research Division of the Congressional Research Service, compiled the references and wrote the annotations. Mr. Leo Orleans, China Research Specialist, also of the Library of Congress provided general guidance and advice. Ms. Leslie Loflin of the Committee staff developed the index and prepared the report for printing.

It is my hope that this bibliography may be useful to you and those members of the Committee on Science and Technology and the House who have an interest in the development of science and technology in China.

Sincerely yours,

RAY THORNTON, *Chairman,
Subcommittee on Domestic and International
Scientific Planning and Analysis.*

LETTER OF SUBMITTAL

THE LIBRARY OF CONGRESS,
CONGRESSIONAL RESEARCH SERVICE,
Washington, D.C., March 9, 1976.

HON. RAY THORNTON,

*Chairman of the Subcommittee on Domestic and International Scientific
Planning and Analysis, Committee on Science and Technology, U.S.
House of Representatives, Washington, D.C.*

DEAR MR. CHAIRMAN: I am pleased to transmit to you and the members of the Subcommittee on Domestic and International Scientific Planning and Analysis an annotated bibliography on Science and Technology in China. The bibliography covers materials on science and technology as they relate to the developmental process of the People's Republic of China. Although most of the sources cited are from the period 1970-1975 there are some selected references covering the years 1949-1970.

The bibliography was prepared by Ms. Claire Geier, Analyst in Science and Technology, Congressional Research Service, Library of Congress with the assistance of Ms. Karen Guarisco, Analyst in the Science Policy Research Division, CRS. It was done in consultation with Mr. Leo A. Orleans, China Specialist, Reference Department, Library of Congress. Mr. Orleans will prepare two forthcoming papers in the series for your committee.

Sincerely,

NORMAN BECKMAN,
Acting Director.

LETTERS TO THE EDITOR

Dear Sir,

I have the honor to acknowledge the receipt of your letter of the 10th inst. in relation to the above subject, and in reply to inform you that the same has been forwarded to the proper authorities for their consideration.

I am, Sir, very respectfully,
Your obedient servant,
J. H. [Name]

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INTRODUCTION

Following the informal establishment of communication between the United States and China in 1972, there came a series of selected, unofficial exchange trips by scholars and scientists, including scientists in the medical field. The ensuing accounts and official reports indicated a nation vastly changed from pre-1949 days. The initial enthusiasm of many travelers and observers produced a variety of articles, reports and personal accounts summarizing the state of Chinese science and technology, including health care. Some reports seem greatly exaggerated while others appear to be more sober in their evaluations. Almost all indicate a nation with a unique approach to science and technology policy that may offer some interesting examples to the West and to developing countries.

There is a basic difference in the nature of the publications about China's science and technology published before and after 1972—a difference that is clearly evident in this bibliography. Until 1972, very few westerners managed to enter China, so that the overwhelming proportion of the writing on science and technology, of necessity, had to rely on a careful review of a large volume of Chinese publications dealing not only specifically with science and technology, but with a variety of other related subjects. With China gradually allowing selective travel came the opportunity for first-hand observation to verify earlier writings.

Today, more and more developing countries are looking to China as a possible model for them to follow. China has made very substantial social and economic progress over the past quarter of a century and in the process has attempted numerous experiments and introduced a variety of innovations worth examining. Whether or not China constitutes a viable model for the other countries of Asia, Africa, and Latin America is a moot question. However, anyone concerned with the role of science and technology in the developmental process can learn from an examination of the People's Republic of China.

Although this is not an exhaustive bibliography of science and technology in China, it is fairly comprehensive, covering developments from 1970 through 1975 with selected references from the years prior to 1970 included. The citations are drawn from English language publications which are readily accessible in most libraries. Some references are drawn from an earlier, more exhaustive bibliography on the same subject, *Science and Technology in the Development of Modern China*.¹

¹ Dean, Genevieve, "Science and Technology in the Development of Modern China." University of Sussex. Mansell Information Pub. Ltd., 1974. 245 p.

SCIENCE POLICY

1. Berberet, John A., "Science and Technology in China." *Current Scene*, v. 10 (September 1972), pp. 12-16.

Describes the organizational structure for science and technology in the People's Republic of China. The author notes the progress of the regime in science and technology since 1949 as well as the setbacks caused by the Cultural Revolution. He also discusses the current manpower, research and development levels and their contributions to the future of scientific development.

2. Chambers, David Wade, and Faggetter, Rachel, "The Impact of the New Revolutionary Movement on Science in China." *Science Forum*, v. 7 (December 1974), pp. 3-6.

Discusses the linkage between criticism of Lin Piao and Confucius embodied in the *Pi Lin Pi Kung* movement. The movement is an attempt to enhance the 'Serve the People' ethic by criticizing the class distinctions and social mores of Chinese history.

3. Dean, Genevieve C., "Science, Technology and Development in China as a 'Case Study'." *China Quarterly*, v. 51 (July-September 1972), pp. 520-534.

Summary and implications of discussions at Sussex Study Group on Science and Technology in China's Development, January 1972. Choice of technology; rate and direction of technological change; science policy. Priorities for research in the field.

4. Dean, Genevieve C., "Science and the Thought of Chairman Mao." *New Scientist*, v. 45 (February 12, 1970), pp. 298-299.

The Maoist strategy for applying science to the problems of modernization calls for reorganization of the scientific establishment, and general education in science.

5. Dean, Genevieve C., and Maciotti, Manfredo, "Scientific Institutions in China." *Minerva*, v. 11 (July 1973), pp. 318-334.

Discusses the development and gradual marriage of science to technology in China during the pre-Communist regimes. The authors describe the aims of Chinese science policy as it has evolved since 1949, concluding that science has contributed to agricultural and industrial development in spite of the interruption caused by the Cultural Revolution.

6. Deshingkar, G. D., "Science and Technology in China: A Preliminary Inquiry." *China Report*, v. 10 (September-December 1974), pp. 69-90.

In spite of their status in science and technology in relation to the West, the Chinese have already made a contribution as far as the Third World is concerned.

7. Esposito, Bruce J., "Science in Mainland China." *Bulletin of the Atomic Scientist*, v. 28 (January 1972), pp. 36-40.

Although some Western observers have been allowed inside China, the Chinese puzzle still remains. The author assesses the development of science in China as a consequence of the Cultural Revolution. He believes that Western news media tend to exaggerate the chaos wrought on Chinese science by the Cultural Revolution although some damage has occurred.

8. Gould, Sidney H. (ed.), *The Sciences in Communist China*. American Association for the Advancement of Science, Washington, D.C., (1961).

Although this volume is 15 years old, it is still an important source, presenting the state of art kind papers on the various sciences in China as of the end of 1960. A total of 26 papers on specific disciplines are presented under the following major sub-headings: science and society, biological and medical sciences, atmospheric and earth sciences, mathematics and the physical sciences and engineering and electronics. Nothing comparable has been produced since then.

9. Gupta, Krishna Prakash, "Society as a Factory: Maoist Approach to Social Sciences." *China Report*, v. 8 (May-June 1972), pp. 36-57.

Part of a larger research project on Higher Education in China, this paper focuses on the Maoist approach to Social Sciences. The author discusses the changes involved in the Social Sciences as they are transformed from purely academic disciplines into strategic studies of manipulated change. In China, Social Scientists are trained in the task of implementing Maoist policies and programs.

10. Jen, C. K., "Mao's 'Serve the People' Ethic." *Bulletin of the Atomic Scientist*, v. 30 (March 1974), pp. 15-25.

The "serve the people" ethic is among the most ubiquitous slogans displayed in public places and has now developed into a powerful ethic. It is accompanied by a spirit of self-reliance in all areas of science research. The author concludes that this spirit is enabling the Chinese to catch up with the advanced nations of the world.

11. "Life in the Academy of Science." *China News Analysis*, no. 843 (June 4, 1971).

Entire issue discusses life in the Academy of Sciences in China since the Cultural Revolution. Concludes that the "... Academy of Science is under the dictation of ignorant soldiers. Specialization and theoretical studies are being discouraged. Some of the reports quoted express what the scientists themselves think about this, how discouraged they are, and how difficult they find it to adjust themselves to this new world."

12. Lindbeck, John M. H., "An Isolationist Science Policy." *Bulletin of the Atomic Scientists*, v. 25 (February 1969), pp. 66-72.

The author presents a brief history of Chinese interaction with the scientific and educational systems of both the USSR and a number of non-Communist nations. Varying degrees of Chinese participation within international scholarly communities are evidenced between the years 1872-1969. Promising developments in scholarly and scientific relationships have been made. However, restrictions on such encounters have also hindered the expansion of constructive communication between Chinese intellectuals and those of other nations. The author predicts that changes in the Chinese policy of restricting such exchanges are unlikely in the near future.

13. Niu, Sien-chong, "Scientific and Technological Development of Communist China." *NATO's Fifteen Nations*, v. 15 (April-May 1973), pp. 89-96.

Examines the effectiveness of the system of scientific research and development in China since 1949. The author points to the rich heritage of the Chinese over the past millenium to partly account for successes over the past 25 years, e.g., nuclear and computer technology. He says, however, there are potential harmful effects of the overemphasis on applied rather than basic research.

14. Oldham, C. H. G., "Science and Technology Policies." In: Michel Oksenberg (ed.), *China's Developmental Experience*. Proceedings of the Academy of Political Science, v. 31 (March 1973), pp. 80-94.

A general review of policies relating to various fields of science and technology.

15. Orleans, Leo A., "China's Science and Technology: Continuity and Innovation." In: U.S. Congress, Joint Economic Committee. *People's Republic of China: An Economic Assessment*, Washington, U.S. Government Printing Office (1972), pp. 185-219.

"The policies that guided scientific and technological development in China during the 15 years prior to the Cultural Revolution are still in effect". . . Important changes brought by the Cultural Revolution were "more a reflection of innovations in the economy and education than in science and technology per se. Basically, then, China continues to 'walk on two legs' in science and technology." Historical survey; continuity of ideology and policies; how the Chinese scientist survives; education and manpower for science and technology; science and technology in practice (R&D and innovation); publication and cross-pollination in science and technology (journals and books; exchange of information; international contacts).

16. Orleans, Leo A., "Research and Development in Communist China: Mood, Management and Measurement." In: U.S. Congress, Joint Economic Committee. *An Economic Profile of Mainland China*, Washington, U.S. Government Printing Office (1967), pp. 549-578.

Discusses the role and goals of R&D within China's political and social setting, as well as the structure, performers and content of the effort. Attempts to measure both the human and capital resources invested in R&D.

17. Richter, Maurice N., Jr., "Chinese Science Policy: A Comparative Analysis." *Bulletin of the Atomic Scientists*, v. 32 (March 1976), pp. 13-16.

A comparative analysis of the respective science policies of China, the USSR, and the open societies of the West is presented. "The Chinese model is . . . milder than the Stalinist approach in the constraints which it places on science in terms of doctrinal conformity and also milder in its application, in that scientists have not been victims of generalized terror comparable to that which occurred under Stalin's rule. However, the Chinese approach is nevertheless more extreme than the Stalinist approach in another respect; the Chinese leaders have made a particularly strenuous effort to minimize distinctions between experts and ordinary people, as part of a broader effort to minimize elitism and specialization in the division of labor generally." A comparison of liberal Western science policies with those of China reveals the totalitarian China's rejection of the liberal ideal of "scientific autonomy."

18. Rifkin, Susan B., "The Chinese Model for Science and Technology: Its Relevance for Other Developing Countries." *Technological Forecasting and Social Change*, v. 7, no. 3 (1975), pp. 257-271.

This paper examines the growth of an indigenous scientific and technological capability through self-reliance (the "Chinese model"). ". . . Self-reliance is the ability to manage one's own national growth process. It is this vision which is most relevant to the developing countries as they seek to share the material wealth enjoyed by inhabitants of the industrialized nations."

19. Shapley, Deborah, "Chinese Science: What the China Watchers Watch." *Science*, v. 173 (August 13, 1971), pp. 615-617.

"Mostly, China watching consists of interpreting Chinese publications or their translations." They also check on each other. The author notes that there are many different perspectives on the status of Chinese science and scientists. In spite of differing views, China watchers have been fairly successful in keeping close track of scientific developments on Mainland China.

20. Sheinin, Rose, "Science in China Today: Weaving Ancient Wisdom into a Modern Tapestry." *Science Forum*, v. 38 (April 1974), pp. 10-12.

Upon returning from a visit to the People's Republic, the author discusses the long tradition of merging excellence in a fundamental and applied science in Chinese history. She notes, "it is in the development and application of science policy that some of the most striking developments are apparent." The most practical problems that have been solved are: feeding and providing health care for the people, and developing a solid industrial base.

21. Shih, Joseph Anderson, "Science and Technology in China." *Asian Survey*, v. 12 (August 1972), pp. 662-675.

Relying primarily on refugee interviews and secondary material, the author describes the progress of Chinese science and technology over the past 20 years and attempts to forecast the future. In general, strides have been made in all areas due to the emphasis on basic and theoretical research. However, the author forecasts greater emphasis on applied research in the future. Overall the integration of theory with practice has contributed greatly to the Chinese progress.

22. Smith, Emil; Coe, Robert; Tseng, Alexander; and Killgren, Joyce, "Walking on Two Legs: A Panel Discussion of Science Policy in the People's Republic of China." *The American Academy of Arts and Sciences Bulletin*, v. 28, no. 2 (November 1974), pp. 26-41.

In the realm of science policy, "walking on two legs" "refers mainly to the balance China has sought to achieve between 'pure' science and applied technology." After visiting China, four American scientists present their observations of scientific practices in that nation. A report underlying all presentations is the major focus of university research on application rather than on theory.

23. Suttmeier, Richard P., "Party Views of Science: The Record From the First Decade." *China Quarterly*, no. 44 (October-December 1970), pp. 146-163.

Discusses the Party's influence on science and science organization through the 1950's. Science was viewed as utilitarian—as an instrument for the betterment of society. The author identifies the 6 elements, as identified by Ch'en Po-ta in 1952, that pervaded in science throughout the decade. The underlying theory, however, was that science serve production.

24. Suttmeier, Richard P., *Research and Revolution: Science Policy and Societal Change in China*. Lexington, Massachusetts: D. C. Heath and Co., 180 p. (1974).

Developmental science policy is unique to the People's Republic of China in several respects. The author reviews and assesses the whole spectrum of science in China. Topics include: 1) Research, Innovation and Developmental Science Policy: a Perspective; 2) Policy Shifts and Abiding Principles for Chinese Scientific Development; 3) Organization-Building for Science, 1949-1957; 4) Alternative Models for Organization and Administration of Chinese Science Programs; 5) Technological Mobilization: Science, Technology, and the Chinese Masses; 6) Conclusion: On the Idea of a "Chinese Model." The author concludes that the Chinese approach to scientific and technological development has been both developmental and integrative. Will this pace lead to the "science-society" crisis of developed nations or will the developed nations eventually look to China for guidance in solving these problems? According to the author these questions are important even without answers.

25. Suttmeier, Richard P., "Science Policy Shifts, Organization, Change and China's Development." *China Quarterly*, no. 62 (June 1975), pp. 207-241.

"One of the most notable features of post-1949 China has been its striking periodicity." "... The Chinese model for scientific development is in fact a series of competing models—one which promotes research, education, specialized management and innovation from the top downwards, but tends towards social stratification and organizational rigidity: and one which promotes the integration of science with society ... but which seriously neglects specialized training and specialized management."

26. Yamada, Keiji, "The Development of Science and Technology in China: 1949-65." *The Developing Economies*, v. 9 (December 1971), pp. 502-538.

Written in September 1966, this article discusses the growth of research and development prior to the Cultural Revolution with emphasis on the role played by the Chinese Academy of Sciences. Although the organization of R&D has changed since 1966 the author contends that the role of the Academy cannot be ignored in assessing the future development of science.

27. Yang, Chen-ning, "C. N. Yang Discusses Physics in the People's Republic of China." *Physics Today*, v. 24 (November 1971), pp. 61-63.

A noted Nobel Prize physicist discusses physics in the People's Republic of China. Contrary to earlier impressions, he discovered that industrial production has made significant progress over the last 15 years. "China, however, is still an industrially backward country."

TECHNOLOGY POLICY

28. Dean, Genevieve C., "China's Technological Development." *New Scientist*, v. 54 (May 18, 1972), pp. 371-373.

The applicability of Chinese policies for technological development to other developing countries. Based on the report of Study Group of Science and Technology in China's Development, University of Sussex, January 1972.

29. Dean, Genevieve C., "Innovation in a Choice of Techniques Context: The Chinese Experience, 1958-1970." *Bulletin of the Institute of Development Sciences*, v. 4 (1972), pp. 39-48.

Since the Great Leap Forward there has been consistency of policies for technological advance in state-owned industries using imported modern, large-scale, capital-intensive technologies and in the agricultural and consumer goods sectors which use traditional, small scale, labor-intensive technologies.

30. Dean, Genevieve C., "A Note on the Sources of Technological Innovation in the People's Republic of China." *The Journal of Development Studies*, v. 9 (January 1972), pp. 187-199.

The development of indigenous sources of technological innovation in the capital construction industries in China, with particular reference to the design reform movement of 1964-66. "The main purpose of this note (is) to trace some of the changes in the organization of innovative activity in China which might account for the widening spectrum of technological options available to the planners in recent years" e.g., as inferred by Shigeru Ishikawa.

31. Dornberger, Robert F., "The Transfer of Technology to China." *Asia Quarterly*, no. 3 (1974), pp. 229-252.

The author discusses the role of borrowed technology within the total contribution of technological change. Emphasis is on the specific engineering techniques introduced directly in the production process as the result of a decision by the government or an agent of the government, which led to the import of technology from abroad, exchange of scientists, importation of books, and articles or documents from abroad.

32. Heymann, Hans Jr., "Acquisition and Diffusion of Technology in China." In: U.S. Congress, Joint Economic Committee, *China: A Reassessment of the Economy*. Washington, U.S. Government Printing Office (1975), pp. 678-729.

China's pursuit of self-reliance has made it possible for her to achieve a high degree of technical and economic independence from the outside world, but in qualitative terms, technology

imports are still a key factor in the development of the more sophisticated sectors of China's industrial production system. Review of policies and discussion of constraints on imports of technology.

33. Hoshino, Yoshiro, "China's Technological Line During the Cultural Revolution." *Developing Economics*, v. 11 (March 1973), pp. 23-38.

Technical conditions peculiar to socialism. Basic starting point of China's cultural development. The contradiction between technical specialization and the masses. Fundamental change in engineering colleges. Criticism of the ideology in engineering textbooks. The problem of the reflection of classes in technology. New technological development with agriculture as the base and industry as the leading factor.

34. Ishikawa, Shigeru, "A Note on the Choice of Technology in China." *The Journal of Development Studies*, v. 9 (October 1972), pp. 161-186.

Chinese planners' choice between known and available technologies, and between techniques that are immediately applicable to industrial and agricultural production; considered in terms of the planners' basic objectives, their criteria of choice, technical and technological alternatives, and objective conditions which constrain or facilitate the planners' choice; reviewed in the three phases which have characterized Chinese development: the "Soviet model", "Great Leap Forward", and "3 and 4 Five Year Plan" phases. The Maximum Growth Criterion and the investment-inducement mechanism.

35. Kojima, Reiitsu, "China's Indigenous Technology." *Technology and People*, Part 1 (Spring 1972), pp. 57-61; Part 2 (Summer 1972), pp. 57-66.

1—Superstitions of the Chinese masses and "science". 2—Western European science and technology and revolutionary thought. 3—The Great Leap Movement, the theory and two kinds of superstitions, and the transformation of people: The first FYP; Eradication of blind belief in foreign science and technology; The core of eradicating two kinds of superstition; New idea of technology—What is the idea of indigenous technology; Two trends in invention. 4—The stage after the Cultural Revolution.

36. Lee, Rensselaer W. III, "Ideology and Technical Innovation in Chinese Industry 1949-1971." *Asian Survey*, v. 12 (August 1972), pp. 647-661.

Between 1949 and 1971 the People's Republic of China has sought to integrate technical innovation with ideology. Thus Maoist emphasis has been upon workers' contributions to innovation, emphasizing that they be masters not the slaves of their machines. The author feels that the workers' technical power (which is allied to anti-foreignism), may diminish as China's relations with foreign countries increase.

37. Lee, Rensselaer W. III, "The Politics of Technology in Communist China." In: Chalmers Johnson (ed.) *Ideology and Politics in Contemporary China*. Seattle, University of Washington Press, (1973), pp. 301-325.

Discusses the relationship between technical democracy in China and the long-run objectives of the Communist leadership. The subject is treated on two levels: ideology and function. Overall the article traces the evolution of Communist technological policies in China from the early 1950s to the present.

38. McFarlane, Bruce, "Mao's Game Plan for China's Industrial Development." *Innovation*, no. 23 (August 1971), pp. 2-12.

Discuss[es] . . . Chinese policies on industrial and agricultural technology in the context of policies for long-term economic development and political and ideological goals . . . Distribution of industrial development; emphasis on small- and medium-scale enterprises; plant self-sufficiency as a function of self-reliance and mass participation in production decisions . . . Obstacles to technological development: unintegrated character of the parts industry prevents emergence of highly skilled technical people; lack of a core of innovation managers; inadequate system of diffusing innovations . . . Concludes that "one of the advantages of the Chinese approach so far is that it regards economic growth as more than a mere function of physical investment and technological progress. . . . The Chinese contend that the human factor—including motivation—is a vital part of the equation leading to economic development."

39. Maciotti, Manfredo, "Hands of the Chinese." *New Scientist and Science Journal*, v. 50 (June 10, 1971), pp. 636-639.

"It is the purpose of this article to attempt to assess the scientific and technological capability of the People's Republic of China today. To this end, the author defines the position of China in relation to the rest of the world in the broad areas of culture, education and science, as well as in four advanced technologies (nuclear, missiles, jet aircraft and computers). The main conclusion of this survey is that China is emerging as the third scientific and technological power of the world, although this rank might be challenged by Japan."

40. Rawshki, Thomas G. "Problems of Technology Absorption in Chinese Industry." *American Economic Association*, v. 65 (May 1975), pp. 383-388.

The author discusses the factors influencing the problems of import substitution and technology transfer in China's developing economy. He proposes that the older and smaller private engineering units are better suited to developing new products and techniques than the larger units. The author concludes that domestic engineering producers must begin to display the flexibility which is shown by their advanced countries counterparts if they wish to cope with large demand shifts in the economy.

41. Schuman, Julian, "Technology Interest." *Far Eastern Economic Review*, v. 78 (December 23, 1972), pp. 31-32.

The main Chinese emphasis in the field of imports is on technology and equipment with a high technical content. Competition for the China market by the industrialized nations is now directed towards this need. The China market will not be cornered by any one nation. Recent trade developments between China and Britain.

42. Sien-Chong, Niu, "Scientific and Technological Developments of Communist China." *NATO's Fifteen Nations* (April-May 1973), pp. 89-96.

The author first presents several indicators of the scientific and technological capacity of China today. Qualified scientists and engineers, advanced levels of education, and adequate industrial resources all stimulate developments in nuclear weapons and computer technology. Ch'en Po-ta's speech on the Chinese Communist Party's view of science finishes the article.

43. Tsu, Raphael, "High Technology in China." *Scientific American*, v. 227 (December 1972), pp. 13-17.

A visiting physicist to China concludes that the country is building the technological foundation it needs for rapid industrial growth. The author noted sophisticated oil refineries and other signs of maturing heavy industry: a hydraulic press, advanced work on controlled fusion with laser heating methods, and computer technology.

44. Uchida, Senko, "Technology in China." *Scientific American*, v. 215 (May 1966), pp. 37-45.

Review of China's stated technical goals and policies, problems, and extent of her advancement in key industries. China is more a developing country than a communist one. China now seeks to develop a technology of design by seeking technical assistance and knowledge from non-Communist countries. The unorganized structure of China's industry and technology is an obstacle to the development of specialized skills and efficient production. Increasing emphasis on mechanization and automation. Growth of technology in iron and steel, chemical and machine industries. China is ten to fifteen years behind the technologies of modern industrialized countries.

45. Wheelwright, E. L. and McFarlane, Bruce, "Technological Policy." A chapter in: *The Chinese Road to Socialism: Economics of the Cultural Revolution*, New York: Monthly Review Press (1970), pp. 162-180.

The authors visited China in 1966 and 1968. Chapter 9—Technological policy: The milieu of technology, an economy distinguished by social control and by the discipline of the unified state plan, to which is attached the 'motor' of moral incentives; the practice, descriptions of case studies; the theory, why

have the Chinese been content to pursue a policy in which self-reliance, medium-scale technology . . . are pursued at the cost of lower productivity?; technological achievements, case examples; manpower and science, science and economic planning; technology and the revolution in education; problems, the main problems appear to lie in technological policy.

46. Whitson, William W., "China's Quest for Technology." *Problems of Communism*, v. 22 (July-August, 1973), pp. 16-30.

Discusses China's position vis-a-vis increased East-West trade in order to examine the political and economic factors likely to influence China's trade policies with non-Communist countries, especially the import of advanced industrial technology. Examines the two ideological lines of development—Liuist and Maoist—between 1949 and 1972.

SCIENTIFIC ORGANIZATIONS AND INSTITUTIONS

47. Benn, Anthony W., "China—Land of Struggle, Criticism, and Transformation." *New Scientist*, v. 53 (January 6, 1972), pp. 10-12.

The author records observations made on his trip to China in 1971. Effect of the Cultural Revolution on the organization of scientific institutions; elimination of duplication of effort by merging China Academy of Science institutes with industrial research institutes, or by centralizing administration to provincial and local government level. Academy retains overall responsibility for research. Allocation of scientific resources to space, computer programs. Research workers sent to factories and countryside, then return to their institutes to work on practical problems; veteran workers lecture, bring problems to the institutes. Links between schools and universities and production. Reorganization of Chinese Medicine follows the same patterns.

48. Chao, E. C. T., "Contacts with Earth Scientists in the People's Republic of China." *Science*, v. 179 (March 9, 1973), pp. 961-963.

An American geologist discusses his visit to China as a private citizen, and summarizes the status of geology in China: geological brigades and bureaus, geological institutes and research, glimpse of current activities, Institute of Geology and Paleontology, and Department of Geology and Geography, Peking University.

49. "Chinese Science on the Mend." *Current Science*, v. 9 (August 1971), pp. 17-18.

Reappearance of Chinese officials in charge of scientific organizations after the Cultural Revolution; list of foreign scientists visiting China. Shift in focus from theoretical to applied research.

50. Esposito, Bruce J., "The Cultural Revolution and China's Scientific Establishment." *Current Science*, v. 12 (April 1974), pp. 5-12.

"In the wake of the Cultural Revolution, the scientific establishment as a whole underwent reorganization. It was streamlined and decentralized, but more significantly there was a shift of emphasis in scientific research to the creative power of the masses." The author reviews the resultant changes in the science structure of the PRC.

51. Nunn, Susan Swannack, "Research Institutes in the People's Republic of China." *U.S. China Business Review*, v. 3 (March-April 1976), pp. 39-50.

"Describes the general picture and surveys what appears to happen when a scientific delegation from the PRC visits an American company, the role of the Chinese Academy of Sciences (CAS) in overall research in China, the status of agricultural biological, medical, engineering and technical research in the PRC,

China's research priorities with emphasis on applied research, and China's purchases of scientific instrumentation from abroad."

52. San-Dun, Gu, "Fish Biology in China." *Copeia*, no. 2 (May 23, 1975), pp. 404-412.

The author visited a number of Chinese research institutions; reports are presented on such organizations as the Institute of Zoology at Academia Sinica in Peking, the Institute of Oceanology in Tsingtao, the Ximen Fishery College, the Shanghai Natural History Museum, and the Dalian Maune Fishery Institute. A brief discussion of Chinese freshwater fish culture is also presented. A section on scientific exchanges and ichthyological publications follows. Last, the author discusses the Chinese policy of self-reliance and its effect on the field of science.

53. Surveys and Research Corporation, *Directory of Selected Scientific Institutions in Mainland China*. Stanford, Hoover Institution Press for the National Science Foundation (1970).

A compilation of information (pre-1966) concerning research and development institutions in China. Year of establishment, facilities, nature of work, major activities, publications, and biographic sketches of key scientific and administrative personnel in 490 selected institutions. The fields covered are the physical, biological, medical and agricultural sciences, and engineering.

54. Suttmeier, Richard P., "Chinese Scientific Societies and Chinese Scientific Development." *Developing Economics*, v. 11 (June 1973), pp. 146-163.

The argument running through this paper is that Chinese scientific societies formed an invaluable administrative resource for overcoming organizational deficiencies in a relatively differentiated and variegated system of science-related institutions. Appendix: Professional societies in the natural sciences and engineering fields as of 1966.

55. Tien, H. Ti, "A Report to the Council of the Biophysical Society: Biophysical Research in the People's Republic of China." *Biophysical Journal*, v. 15 (1975), pp. 621-631.

After describing the history, organization and achievements of several Chinese research institutes, the author discusses the effect of the Cultural Revolution on scientific research in China. Observations on the value of scientific exchange with China are also offered.

56. Wang, Chi, *Mainland China Organizations of Higher Learning in Science and Technology and Their Publications*. Washington, Library of Congress (1961).

Includes learned societies, universities and colleges, Academia Sinica and affiliated research institutes, Chinese Academy of Medical Science and branch institutes, Chinese Academy of Agricultural Sciences and branch institutes, governmental research organizations, and libraries. Publications include serial

publications, abstracting and indexing services, bibliographies, and dictionaries. Also, membership totals and local branches of learned societies, scientific departments of universities and colleges, size and type of collections of libraries and botanical gardens.

57. Yuan-li and Sheeks, Robert, *The Organization and Support of Scientific Research and Development in Mainland China*. New York, Praeger (1970).

Focuses on the acquisition and use of knowledge in science and technology through research and development in China. Seeks to establish the available facts on organization and support of science, and makes observations on the methods by which the Chinese have acquired and used new knowledge in the scientific and technological fields. The study includes basic and applied research and development, testing and standardization, training, scientific and technical information activities, collection of general purpose data, and popularization of scientific and technical information.

AGRICULTURE

58. Albertson, M. L., "Impressions of the People's Republic of China, Agricultural Engineering." *Mechanical Engineering*, v. 97 (June 1975), pp. 26-27.

"China has been confronted with the problem of maintaining a delicate balance between two objectives in agriculture—full employment of its enormous population and also expanding agricultural mechanization." To accomplish these goals, China has strived to better commune self-reliance in both the agricultural and industrial sectors, and to increase the production of farm and pumping machinery.

59. Cheng, Chu-Yuan, "Food and Agricultural Problems in China." *Current History*, v. 65 (September 1973), pp. 120-123.

"Ever since the inauguration of the new government in 1949, agriculture has been the Achilles' heel of the Chinese economy." The author discusses the two most significant factors (according to him) affecting Chinese agriculture: weather conditions and the government's policies toward the peasantry.

60. Ching, Te May and Ching, Kim K., "A Glimpse of Forestry in China." *Journal of Forestry*, v. 71 (July 1973), pp. 426-427.

Chinese forestry is interesting to other Nations for two reasons. First, the Chinese indigenous tree flora is among the richest in the world. Second, since the 1966-68 Cultural Revolution, many changes have occurred in Chinese forestry. The authors discuss some of these changes.

61. Ensminger, M. E., "The Farming We Saw in China." *Farm Journal*, v. 97 (January 1973), pp. 21-23, 34.

"This is an eye witness account by the first U.S. scientist in 25 years to be invited to visit farms in China and address the China Academy of Agriculture and Forestry." The author concludes that we have much to learn from the Chinese in the area of multiple cropping, although much of the farming is primitive.

62. Erisman, Alva Lewis, "China: Agricultural Development 1949-71." In: U.S. Congress, Joint Economic Committee. *People's Republic of China: An Economic Assessment*, Washington, U.S. Government Printing Office (1972), pp. 112-146.

Two distinct periods of agricultural development policy are distinguished by investment policies. 1949-61: investment from within agriculture itself, intensive application of labor on an inelastic supply of cultivated land. 1962-71: large and increasing amounts of chemical fertilizers, pesticides, equipment for irrigation and drainage projects, farm machinery. Tabulated statistics.

63. Erisman, Alva Lewis, "China: Agriculture in the 1970's." In: U.S. Congress, Joint Economic Committee. *China: A Reassessment of the Economy*. Washington, U.S. Government Printing Office (1975), pp. 324-349.

Review of the development of China's agriculture; current inputs, performance and foreign trade. Future production is closely related to the supply of nitrogen fertilizer, the production of which is increasing rapidly.

64. Field, Robert Michael, "Chinese Agriculture in the 1970's: Production, Consumption and Trade." *Asia Survey*, v. 13 (October 1973), pp. 908-913.

The author discusses the level of Chinese agricultural production and considers the prospects for the seventies. In spite of a generally favorable outlook, he considers the North Plain of China a problem. For this he suggests a systematic program to construct large, well engineered projects.

65. Kung, Peter, "Farm Crops of China." *World Crops* (March-April 1975), pp. 55-64.

Modernization programs begun in the People's Republic during the 60's have added new dimensions to agricultural progress in China in the 70's. The author cites progress in rice, wheat, sorghum and maize yields as well as progress made in irrigation. He discusses China's main crops individually, noting developments and progress made in the past decade.

66. Kuo, Leslie T. C., *The Technical Transformation of Agriculture in Communist China*. New York, Praeger (1972).

"This study is primarily concerned with the technical aspects of agricultural development in Communist China, . . . [including] the overall policies, guiding principles, programs and methods for the technical transformation of agriculture adopted during the first two decades of the Communist regime . . . Primary attention . . . given to the planning and execution of the programs rather than to the details of agricultural technology. In each case, the situation before the Communist take-over, the highlights of the programs carried out by the new regime, and the major accomplishments and problems [are] observed. . . ."

67. Perkins, Dwight H., *Agricultural Development in China 1368-1968*. Chicago, Aldine Publishing Co. (1969).

Provides a historical perspective to present developments in China's agriculture. . . . "Traditional" agricultural technology is not sufficient to support China's population. In the early 1960s "traditional" technology was given a secondary role and policy focused on large-scale investment in modern capital inputs: electrification, modern farm implements, machinery, and chemical fertilizer.

68. Perkins, Dwight H., "Constraints Influencing China's Agricultural Performance." In: U.S. Congress, Joint Economic Committee. *China: A Reassessment of the Economy*. Washington, U.S. Government Printing Office (1975), pp. 350-365.

China's shift in priorities toward agriculture in the 1960's was both real and large in scale improving farmer incentives and increasing investment in fertilizer and farm machinery. Although agricultural output will continue to grow, there are no major breakthroughs in sight.

69. Rouse, Hunter, Dr., "Impressions of the People's Republic of China, China: a New Land." *Mechanical Engineering*, v. 97 (February 1975), pp. 28-29.

The author presents his first impressions of China during a recent trip to that nation. Chinese historical background, agricultural practices, and the changes in engineering education are briefly discussed.

70. Sinha, R. P., "Chinese Agriculture: Past Performance and Future Outlook." *Journal of Agricultural Economics*, v. 25 (1974), pp. 37-52.

The paper presents both the historical background of agricultural practices in China and recent developments in Chinese farming. Post-World War organizational and technical changes are discussed. The author concludes that the future outlook for Chinese agriculture appears fairly optimistic.

71. Sprague, G. F., "Agriculture in China." *Science*, v. 188 (May 9, 1975), pp. 549-555.

Based on a visit to China in 1974, the author presents his observations on the status of agriculture in China. He comments that the ability of the Chinese to feed over 800 million on 11% arable land is remarkable as is the impressive crop yields in rice, wheat, sorghum, and maize. Also, in contrast to American reliance on rain for agriculture, the Chinese have used irrigation successfully.

72. Wortman, Sterling, "Agriculture in China." *Scientific American*, v. 232 (June 1974), pp. 13-21.

Although the country has made remarkable agricultural advances, China faces two serious problems. First, the emphasis on applied research and short term benefits; second, the government's efforts to retard the growth rate. Eventually there will be a need for increased basic research, and the population control efforts will have to be successful to maintain a raised standard of living.

AVIATION AND SPACE TECHNOLOGY

73. Bueschel, Richard M., *Communist Chinese Air Power*. New York, Praeger (1968).

Although the title suggests consideration of air power from 1949 onward, the author begins in 1923 with communist cadres trained by Russian pilots. Part I of the book traces the history of airpower from 1923; part II discusses the aircraft of communist China since 1923.

74. Calder, Nigel, "Mao—1 in Orbit." *New Statesman*, v. 79, no. 2042 (May 1, 1970), p. 612.

Political and military implications of the first satellite launched by the Chinese. Use of satellite for survey and communications not economically justifiable. Satellite launch indicates "the Chinese have mustered a formidable array of talent and skill . . ." but diffusion of skills throughout the countryside has yet to be proved.

75. "China Buys Six More Trident 2E's—Cash Sale Totals \$57.5 Million." *Aviation Week and Space Technology*, v. 97 (August 14, 1972), p. 25.

Discusses the second round of Trident 2E orders which began in 1971. The article states: "The Chinese will have a Trident fleet second only in size to British European Airways. Their experience with the aircraft began when they bought four used Trident I's from Pakistan International."

76. "China Joins the Space Age." *Science News*, v. 97 (May 2, 1970), pp. 427-428.

Data on the first Chinese satellite indicate a medium-range ballistic missile capability; the science and technology required for ICBM's is more sophisticated and, although the theoretical knowledge may be available to the Chinese, shortage of engineering and logical know-how and disruption during the Cultural Revolution may be the cause of the lag in Chinese ICBM development. International political and military repercussions of China's missile capabilities.

77. "China Orders Eight Additional Hawker Siddeley Trident Trijets." *Aviation Week and Space Technology*, v. 97 (November 20, 1972), p. 30.

This order for eight additional Hawker Siddeley Trident Trijets brought the total number of orders to 20. A British company flight crew accompanied the jets to China to guide the Chinese in an informal training program.

78. "China Orders Six Trident 2E's." *Aviation Week and Space Technology*, v. 95 (August 30, 1971), p. 21.

Peking's order for six medium range Hawker Siddeley Trident 2E transports after almost a year of behind the scenes negotiations is ok'd. "The Trident 2E, which is identical to those operated by British European Airways, has a range 2,700 mi. and a maximum speed of 612 mph." The backlog order with Chinese aircraft was then 29 aircraft.

79. "China Reviews Aerospace Requirements." *Aviation Week and Space Technology*, v. 102 (June 2, 1975), pp. 279, 283.

The People's Republic of China has increased its capability in aerospace hardware significantly over the past five years, and especially following its break with the Soviet Union. The article discusses the current status of the PRC's air transport system, the nations that deal with the Chinese in this area, and some future expectations of the Civil Aviation Administration of China.

80. Coleman, Herbert J., "Concorde Sales to China Explored." *Aviation Week and Space Technology*, v. 95 (September 27, 1971), p. 24.

Discusses preliminary talks between an Anglo-French Concorde supersonic transport team and the People's Republic of China on acquiring three or four Concorde supersonic transports.

81. "Communist China Orders Two Concordes for 1977 Delivery." *Aviation Week and Space Technology*, v. 97 (July 31, 1972), p. 24.

Discusses the preliminary contract signed by the Chinese for the purchase of two Anglo-French Concorde supersonic transports. The agreement was a firm order rather than an option or a standard indication of intent to buy. Aircraft are expected to be delivered in late 1976 or early 1977.

82. Corning, Gerald, "An Aeronautical Visit to China." *Astronautics and Aeronautics*, v. 12 (April 1974), pp. 16-19.

Impressions of an aerospace engineer after meeting with faculty and students of the Peking Aeronautical Institute and viewing its aeronautical facilities. He concludes that visits such as his and reciprocal trips will promote greater friendship and trust between the two countries.

83. Doty, Laurence, "Chinese Jet Bid May Cloud Trade Policy." *Aviation Week and Space Technology*, v. 94 (March 15, 1971), p. 30.

An early article commenting on the People's Republic of China attempts to expand its commercial air routes beyond the Communist periphery in the Far East. The emergence of a new market evoked a revision of the U.S. policy of isolation towards Red China.

84. Golden, Ronald, "Peking Pushes for an Expanded International Air Transport System." *Aerospace International*, v. 7 (May-June 1971), pp. 18-22.

Prospects of new Chinese international air services: China seeks to buy large aircraft abroad, especially in Britain. China produces versions of various Soviet aircraft. Development of Chinese electronics industry.

85. "NATO Unit Clouds Chinese Interest in Spey Production." *Aviation Week and Space Technology*, v. 98 (April 2, 1973), p. 21.

Discusses the impact of NATO's Cocom (coordinating committee for strategic Western imports) on the People's Republic of China interest in license production of the Rolls-Royce Spey bypass engine and its military derivative.

86. O'Lone, Richard G., "China Emerges as Key Market." *Aviation Week and Space Technology*, v. 98 (May 28, 1973), pp. 44-47.

The author discusses the growing potential of China as a key market for commercial aircraft, and related equipment as a result of its leaders' determination to hasten China's emergence onto the world's airline stage. Some of their activity to date in importing high technology is summarized.

87. O'Lone, Richard G., "No Technical Bars Seen to China Service." *Aviation Week and Space Technology*, v. 96 (February 28, 1972), pp. 22-25.

The author discusses reactions of the first U.S. airline pilots to enter mainland China in over twenty years. He notes they have "... surprisingly light air activity there and discovered that air transport and facilities and equipment, although below U.S. standards, would present no obstacle to commercial service."

88. "Rolls, China Agree on Spey Production Deal." *Aviation Week and Space Technology*, v. 103 (December 22, 1975), p. 37.

Discusses a \$200-million deal between Rolls-Royce and the People's Republic of China, in which the military version of the Rolls-Royce Spey turbofan engine would be manufactured near Peking under license.

ELECTRONICS AND COMPUTER TECHNOLOGY

89. Cheatham, Thomas E., Jr., and others, "Computing in China: A Travel Report." *Science*, v. 182 (October 12, 1973), pp. 134-140.

Reviews the trip of American specialists in computer technology to China in 1972. The 3 week trip covered a tour of computer facilities and discussion of computer technology with Chinese experts. As far as the specialists could determine, the Chinese use computers almost entirely for scientific and engineering calculations.

90. "China Builds Electronic Capability." *Aviation Week and Space Technology*, v. 102 (June 9, 1975), p. 59.

Discusses progress in China's electronics industry, asserting that British experts believe China's capability is rapidly closing the technological gap with the West. This assertion was based on a visit of a delegation of senior executives of British firms hosted by the Chinese Electronic Society.

91. Holland, Wade B., "Perspectives on Chinese Computing." *Soviet Cybernetics Review*, v. 3 (January 1973), pp. 19-24.

Since the opening of relations between the U.S. and the People's Republic, the author notes a burst of interest and enthusiasm for the Chinese computer industry. The author asserts that not all of the enthusiasm is deserved although the Chinese have made impressive strides. He does feel that they have really achieved third generation computers. ". . . it is an oversimplification to call China a third-generation country while the Soviets remain bogged down in their efforts to achieve this level."

92. Nybert, P. Russell, "Computer Technology in Communist China." *Datamation*, v. 14 (February 1968), pp. 39-43.

Organization of R & D in computer technology; Soviet aid; Chinese computers. China still lags in development of computer technology but is narrowing this gap; computer technology will continue to be subordinated to supporting military science in China; it is doubtful whether the Chinese "large transistorized digital computer" represents any kind of a technical breakthrough.

93. Reichers, Philip D., "The Electronics Industry of China." In U.S. Congress, Joint Economic Committee. *People's Republic of China: An Economic Assessment*, Washington; U.S. Government Printing Office (1972), pp. 86-111.

Description of history, production facilities and level of technology of the electronics industry, by product group: electronic components; electronic instruments; computers; communications equipment; consumer entertainment equipment; military electronics. Appendix: major facilities in China's electronics industry.

94. Szuprowicz, Bohdan O., "China's Computer Industry." *Datamation*, v. 21, no. 6 (June 1975), pp. 83-88.

"Starting with the manufacture of copies of Soviet machines, the Chinese have developed their own designs and entered the third generation." Between 1960, when Soviet aid ended and the present, the Chinese have almost reached Western standards. Although they could produce more computers, the allocation of resources to other areas limits the production rate.

95. Szuprowicz, Bohdan O., "Computers in Mao's China." *New Scientist*, v. 65 (March 15, 1975), pp. 598-600.

After visiting China, the President of a computer firm observes: "with only minimal help from the Soviet Union and the West, China has pulled itself into the high technology age. Chinese-built digital computers, electron microscopes and silicon crystal growing furnaces were among the products offered for sale at the Canton Trade Fair."

ENERGY

96. Ashton, John, "Development of Electric Energy Resources in Communist China." In: *An Economic Profile of Mainland China*, U.S. Congress, Joint Economic Committee. Washington, U.S. Government Printing Office (1967), pp. 297-316.

China is one of the most highly endowed countries of the world in terms of energy resources for the development of electric power generation. Article discusses hydroelectric and coal resources, organization and development of the electric power industry, consumption of electric energy, as well as rates, revenues, costs and profits.

97. Daily, James W. Dr., "Impressions of the People's Republic of China, Hydropower: A Mirror of Self-Reliance." *Mechanical Engineering*, v. 97 (May 1975), pp. 32-33.

The article describes both small-scale, communal hydropower units and larger state-owned installations. A short appraisal of present Chinese technical expertise and chances for future progress is given.

98. Gardner, Frank J., "Chinese Oil Flow Up, But Much Larger Gains Needed." *The Oil and Gas Journal*, v. 69 (December 13, 1971), pp. 35-39.

Chinese oil production has strongly recovered since the Cultural Revolution. Refining capacity being steadily expanded. Exploration activity locating oil reserves. Estimate of production, based on *Peking Review* article, November 1971. "... a significant step-up in imports of both petroleum and oil industry equipment will occur during the remainder of this decade." "With nuclear-energy development still in its infancy, coal will probably remain China's principal fuel source for industry power generation, rail transport, and heating during the foreseeable future."

99. Harrison, Selig S., "China: The Next Oil Giant." *Foreign Policy*, no. 20 (Fall 1975), pp. 3-27.

The author presents an overview of Chinese offshore oil explorations and the international implications of China's future oil exports. "The net effect of expanded Chinese oil exports would be to reduce global dependence on the Middle East and the Persian Gulf; but the principal direct beneficiaries of a Chinese export thrust are likely to be Japan and other politically favored customers, especially in Asia."

100. Kambara, Tatsu, "The Petroleum Industry in China." *China Quarterly* (December 1974), pp. 699-719.

The historical background of the Chinese petroleum industry is presented, followed by a discussion of the present oil situation in that nation. Such topics as oil production and reserves, oil refining, domestic demand, and the future prospects of the petroleum industry are presented.

101. Williams, Bobby A., "The Chinese Petroleum Industry: Growth and Prospects." In: U.S. Congress, Joint Economic Committee. *China: A Reassessment of the Economy*. Washington, U.S. Government Printing Office (1975), pp. 225-263.

Discusses the background of the rapid emergence of the PRC as a major oil producer and exporter. Estimates of current and future production, reserves, domestic consumption and refining capabilities.

102. Wolfe, Jessica L., "Political Implications of the Petroleum Industry in China." *Asian Survey*, v. 16 (June 1976), pp. 525-539.

"This article demonstrates the potential ways the petroleum industry can modify the political parameters of Chinese economic development and foreign policy. The themes of self-reliance and simultaneous development central to the Maoist model are underscored as quasi-political variables in the development of this industry. For analytical purposes, the petroleum industry is presented here as the nexus of the Chinese economy: development and change in different economic sectors—agriculture, industry, infrastructure and finance—are all intrinsically related to it. Where political priorities have been relaxed to promote petroleum productivity, the effects of such laxity have permeated these sectors as well. Examination of the petroleum industry reveals that transformation is not merely occurring within the different levels of the economy, but that the Maoist matrix from which economic policy stems is itself being redefined."

103. Wu, Yuan-Li, "China's Energy Resources and Prospects." *Current History*, v. 69 (July 1975), pp. 25-27, 53-54.

The author speculates on the future of China's new major export commodity, oil. The developments leading to Japan's severance of petroleum trade with the Soviet Union and quickening interest in Chinese oil are discussed. Chances for sufficient increases in oil production to provide for both the expansion of Chinese economy and the world's need for oil are also suggested. The author concludes, "Internationally, Peking must seriously consider the desirability of allowing Western technology and capital to enter the country on a larger scale. Domestically, China must consider a wider range of alternatives in economic planning."

104. Yuan, Sy, "China's Chemicals." *U.S. China Business Review*, v. 2, no. 6 (November-December 1975), p. 3752.

"China's chemical industry is still in an early developmental stage. However, a solid and diverse foundation has been laid. There is no lack of determination or talent in China to build upon this foundation a strong and viable chemical and particularly petrochemical industry." The author further asserts that future developments in China's petrochemical industry will be directed towards stimulating the agricultural sector. Chemicals such as pesticides, insecticides, and fungicides will be needed to develop the land. China's textile industry also proves successful. The author closes with a brief discussion on the Chinese response to pollution.

ENVIRONMENT

105. Blumen, William and Washington, Warren M., "Atmospheric Dynamics and Numerical Weather Prediction in the People's Republic of China." *Bulletin of the American Meteorological Society*, v. 54 (June 1973), pp. 502-518.

Surveys accomplishments in areas of atmospheric dynamics and numerical weather prediction between 1949 and 1966 in the People's Republic of China. Topics considered include cumulus and turbulent boundary layer dynamics, and the dynamics of meso-, synoptic-, and planetary-scale motions.

106. Davies, David, "Earthquake Prediction in China." *Nature*, v. 258 (November 27, 1975), pp. 286-287.

"Ten thousand professionals participate in the Chinese earthquake program, ten times the number in the United States, and there is a band of many thousand amateurs. Activity is spread widely over the country and the instrumental content of the program is equally broadly based. Work is being conducted on all types of premonitory symptoms studied in the West—seismic, geodetic, electromagnetic, geochemical, magnetotelluric; and in addition there is considerable interest in acoustic precursors (earthquake sounds) and the unusual behavior of animals." Although the author expresses concern over China's swing away from theory, he applauds Chinese efforts and successes in predicting earthquakes.

107. "Earthquake-prediction Studies in China." *Physics Today*, v. 29 (April 1974), p. 19.

On a recent trip to China as guest lecturer at the Academia Sinica, the author witnessed the rebirth of geophysical research since the Cultural Revolution. The organization and current seismic research activities of three Academia Sinica institutes. A brief description of the basic equipment used at seismographic stations.

108. "Ecology in China." *Chemistry*, v. 46 (October 1973), p. 4.

Cites the success of the Chinese in avoiding river and air pollution waste disposal problems, and depletion of non-renewable resources that face the U.S., Russia, Japan and other highly industrialized nations. The Chinese have made "non waste" a virtue.

109. Kapp, K. William, *Environmental Policies and Development Planning in Contemporary China and Other Essays*. Paris, Mouton and Co. (1974).

China has not avoided all the social costs of development; overall effects of China's environmental policies, which are an integral part of the planned socio-political reconstruction of the country, have been effective.

110. Kapp, K. William, "Recycling' in Contemporary China." *World Development*, v. 3, nos. 7 and 8 (July-August 1975), pp. 565-575.

Presents an overview of current recycling policies in contemporary China within the broader context of China's efforts to protect and improve her social and physical environment. "The paper concludes with a presentation of the Chinese interpretation of the causes of environmental disruption in the light of Chinese sources available in translation."

111. Kellogg, William W. and others, "Visit to the People's Republic of China: A Report from the A.M.S. Delegation." *Bulletin of the American Meteorological Society*, v. 55 (November 1974), pp. 1291-1330.

Summary report of a small delegation of the American Meteorological Society following a trip to China in April and May, 1974. The article discusses the societal, cultural and scientific experiences of the delegation as well as the status of meteorology in the People's Republic.

112. Loeser, C. J., "Water Management in China: Top Priority for 2500 Years." *Water Resources Bulletin*, v. 9 (February 1973), pp. 145-154.

"The civilization of China evolved as a result of interplay between irrigated regions in the higher reaches and flood prone lower basins of two major rivers, the Hwand and the Yangtze." Problems of water control abound through Chinese history. The author describes early projects involving men as hydroelectric engineers, who emerged as cultural heroes to millions of Chinese.

113. Mead, Dale F., "How the Chinese Predict Earthquakes." *Science Digest* (March 1976), pp. 57-61.

The "People's War on Earthquakes" in China is organized into brigades of quake watchers involving large numbers of people. The odd pre-quake behavior of horses and other animals has been used as advance warning, and using this and similar methods, the Chinese have been able to predict eight earthquakes in the last three years.

114. Orleans, Leo A., "China's Environomics: Backing Into Ecological Leadership." In: U.S. Congress, Joint Economic Committee. *China: A Reassessment of the Economy*. Washington, U.S. Government Printing Office (1975), pp. 116-144.

Although China's environmental policies have had a strong economic rationale, China has taken many positive steps to protect the environment. Discusses environmental policies in relation to health and sanitation, agriculture and land utilization, and industrial pollution.

115. Orleans, Leo A. and Suttmeier, Richard P., "The Mao Ethic and Environmental Quality." *Science*, v. 170 (December 11, 1970), pp. 1175-1176.

"Maoism . . . is first and foremost an ethic of frugality, of 'doing more with less'." The Maoist ethic appears to subjugate technological to social development since progress and the development of new technologies remain under human control. The authors note that Maoism, as an environmental ethic, may seem attractive to Westerners who are disturbed about technology and ecology.

116. Rodale, Robert, "The Smog in China." *Environment Action Bulletin*, v. 4 (March 17, 1973), pp. 2-4, 8.

Discusses the problems of smog in China, noting that home heaters, not autos, are the primary culprits of air pollution in Peking. While there are other sources of pollution in China, the author believes that today's leaders will undoubtedly be able to overcome it and move the country in the direction it chooses.

117. Whitney, J. B. R., "Ecology and Environmental Control." In: Michael Oksenberg (ed.) *China's Developmental Experience*, Proceedings of the Academy of Political Science, v. 31 (March 1973), pp. 95-109.

Because of the policies she has been pursuing, China is optimistic about her ability to achieve simultaneously both economic development and environmental integrity, but many questions still remain.

118. Wilson, J. Tuzo, "Mao's Almanac: 3000 Years of Killer Earthquakes." *Saturday Review*, v. 55 (February 19, 1972), pp. 60-63.

"Earthquakes have always been one of China's great scourges. . . . Small wonder then that the regime of Mao Tse-tung has instructed the Institute of Geology of China's Academy of Sciences to concentrate on the predicting of earthquakes." The author discusses the progress.

MEDICINE

119. Blakeslee, Alton, "Chinese Medicine: A Truly Great Leap Forward." *Saturday Review/World* (October 23, 1973), pp. 70-72.

"Can developing countries, or even the United States borrow beneficially some of these [Chinese] techniques? The question is one that specialists in other countries might carefully consider. Significantly, several U.S. medical groups, some supported by the National Institutes of Health, are now investigating [some of them] . . ."

120. Cheng, Tien-hsi, "Disease Control and Prevention in China." *Asia*, no. 26 (Summer 1972), pp. 31-59.

In the last two decades, numerous innovations and changes have been instituted in China for disease control and prevention. Included in this report are highlights of some major programs dealing with parasitic disease, cancer and mental disorders.

121. Cheng, Tsung O., "Health Care in the People's Republic of China." *Clinical Research*, v. 21 (April 1973), p. 536.

The first Chinese-born American physician to visit China in 1971 discusses the many changes he observed during his visit. He notes that for the first time in her history China appears to be self-sufficient in taking care of the medical needs of her people.

122. Cheng, Tsung O., "The New Chinese Medical Journal." *Annals of Internal Medicine*, v. 78 (May 1973), p. 771.

The "Chinese Medical Journal" was first officially published in January 1973 and included articles on many of the exciting new medical events and discoveries of recent years. Discusses the pros and cons of the new medical journal.

123. Chow, Kao Liang, "Brain Research in China." *Brain Research*, v. 57, no. 2 (1973), pp. 34-37.

The author presents a brief eyewitness account of the present research projects at Peking University and the Institute of Physiology.

124. Dehaas, J. H., "Socio-Medical Achievements of the People's Republic of China." *International Journal of Health Services*, v. 3 (February 1973), pp. 275-294.

The authors discuss the advances in health care and formerly non-existent health care delivery since the creation of the People's Republic of China in 1949. They note that achievements in the fields of preventive and curative medicine deserve admiration. In general the campaign for self-reliance has yielded an outcome described as "the sun is shining in the East."

125. Esposito, Bruce J., "The Politics of Medicine in the People's Republic of China." *Bulletin of the Atomic Scientist*, v. 28 (December 1972), pp. 4-9.

Discusses health care policies during the Cultural Revolution. The author asserts that medical assistance in rural areas will definitely improve but will probably be accompanied by a reduction in health standards of urban areas.

126. Geiger, Jack, "How Acupuncture Anesthetizes: The Chinese Explanation." *Medical World News*, v. 14 (July 13, 1973), pp. 51-61.

A visiting medical doctor discusses the anesthetic aspects of acupuncture. "The Chinese have found that acupuncture changes the patient's perception of both the intensity and quality of pain by specific blocking actions at two and perhaps three levels of the central nervous system, without cortical depression and alteration in consciousness that accompanies traditional chemical anesthesia."

127. Hsu, Robert, "Barefoot Doctors of the People's Republic of China: Some Problems." *New England Journal of Medicine*, v. 291 (July 18, 1974), pp. 124-126.

The purpose of this paper is to point out problems and dangers revealed by Chinese publications so that understanding of the barefoot doctors will be more complete and balanced. These problems can be classified into three categories—problems of decentralized training and unsupervised experimentation; decentralized research and development in herbal medicines; and economic incentive and job satisfaction. These problems also cast some doubt on the exportability of the program unless it is appropriately modified.

128. Kao, Frederick, "China, Chinese Medicine and the Chinese Medical System." *The American Journal of Chinese Medicine*, v. 1 (January 1973), pp. 1-59.

Chinese medicine is a fusion of traditional Chinese medicine and modern Western medicine. The author points out that it has attained a universal or ecumenical character over the past two decades but it must still shed many vestiges of its traditional doctrines which may be a hindrance to its further development. The article reviews development over the past 20 years.

129. Liang, Matthew H., "Chinese Health Care: Determinants of the System." *American Journal of Public Health*, v. 63 (February 1973), pp. 102-110.

"A comprehensive review of the political, economic, cultural and legal determinants which have molded the Chinese system for the delivery of health care throws light on some aspects, and raises questions requiring more information."

130. "Medicine in China." *Medical World News*, v. 13 (January 14, 1972), pp. 51-62.

Four doctors, representing different professional disciplines and political philosophies, report on a new medical system.

"They told of a medical community so tightly sutured to a totally cohesive body politic that a process of absorption had begun, one that could eventually cause the practice of medicine to disappear as a distinct entity, becoming instead an invisible, integral part of the society."

131. National Academy of Sciences. *Report of the Medical Delegation to the People's Republic of China*. Washington: National Academy of Sciences, Institute of Medicine (1973).

Describes a trip made to the People's Republic of China by a medical delegation from the U.S. in 1973. Papers cover: China watching, health care, disease control, and nursing and child care. Also included is a log of the visit and notes on a meeting with Vice Premier Li Hsien Nien in Peking.

132. "NMA China Visit." *Journal of the National Medical Association*, v. 65 (January 1973), entire issue.

The entire issue surveys the National Medical Delegation's Visit to the People's Republic of China. Papers include: medical education; observations on medical procedures, implantation and acupuncture; traditional medicine; health service delivery and community health; and other observations.

133. Orleans, Leo A., "*Health Policies and Services in China, 1974*." U.S. Congress, Senate Committee on Labor and Public Welfare, Subcommittee on Health, Washington, U.S. Government Printing Office (1974).

A report on how the Chinese have transformed a country, which 20 years ago had one of the highest death rates in the world, widespread epidemics, and a general lack of sanitation and medical facilities, into one which now affords every individual access to medical care. "It is also a report that takes literally the Chinese insistence that 'you do not do China any favors by exaggerating our accomplishments'."

134. Ratnavale, D., "Psychiatry in Shanghai, China: Observations in 1973." *American Journal of Psychiatry*, v. 130 (October 7, 1973), pp. 1082-1087.

Having visited China the author presents brief general information on acupuncture and describes its use in psychiatry. He stresses the pre-eminence of group activities in the therapy of the mentally ill.

135. "Replanting: Chinese Solutions to the Puzzle." *Medical World News*, v. 15 (April 12, 1974), pp. 27-28.

Discusses certain features of the Chinese procedure for reimplantation. "Certain features of the Chinese procedures seemed especially remarkable to the North Americans: that the Chinese did microsurgery—on vessels as small as 1 mm in diameter—without microscope and that they were able to repair nerves during the first replantation operation."

136. Sidel, Ruth, "The Role of Revolutionary Optimism in the Treatment of Mental Illness in the People's Republic of China." *American Journal of Ortho-Psychiatry*, v. 43 (October 1973), pp. 732-736.

Following two trips to China the author, a social worker, observes that psychiatric treatment involves fostering patient conceptualization of being part of a larger force, the revolution. "Revolutionary Optimism" provides the patience and confidence the patient needs to conquer his illness. The author says the importance of this method cannot be underestimated although it is difficult to assess its effectiveness.

137. Sidel, Ruth, and Sidel, Victor W., "The Delivery of Medical Care in China." *Scientific American*, v. 230 (April 1974), pp. 19-27.

The health of the Chinese people has changed greatly over the past few decades. Since 1949 the Chinese have employed mass movements to improve public health and sanitation, and have initiated programs to train large numbers of health workers. "The main feature of the Chinese system is an integrated network of neighborhood stations that serve the functions of preventive medicine, primary medical care, and referral to larger centers."

138. Sidel, Ruth, and Sidel, Victor W., "The Human Services in China." *Social Policy*, v. 2 (March-April 1972), pp. 25-34.

Based on their observations during a visit to China, the authors describe the human services—social, psychiatric, health and child care—and assess their effectiveness in contrast to prerevolutionary China.

139. Sidel, Victor W., "The Barefoot Doctors of the People's Republic of China." *New England Journal of Medicine*, v. 286 (June 15, 1972), pp. 1292-1300.

"Rural medical services were massively expanded as a result of the Great Proletarian Cultural Revolution, which began in 1965. As part of this expansion, agricultural workers are trained to meet rural needs for environmental sanitation, health education, immunization, first aid, and some aspects of primary care and post illness follow-up; there are now said to be over a million such 'barefoot doctors.'"

140. Sidel, Victor W., "The Health Workers of Fenghong Neighborhood, Peking." *American Journal of Ortho-Psychiatry*, v. 43 (October 1973), pp. 737-743.

A visiting doctor describes the working of a neighborhood health care system in China. He observed that even with flaws, the Chinese system is self-reliant, decentralized, de-professionalized, and well integrated with the needs of the local units. It offers a number of principles adaptable to technologically developed Nations of the West.

141. Sidel, Victor W., "Medicine and Public Health." In: Michael Oksenberg (ed.) *China's Developmental Experience*, Proceedings of the Academy of Political Science, v. 31 (March 1973), pp. 110-120.

Based on Chinese successes the author feels that the U.S. may learn much from them on problems such as drug addiction,

venereal disease, poverty, and the lack of a sense of purpose. He concludes that the U.S.'s future may depend on how well the U.S. assimilates these lessons.

142. Sidel, Victor W., "Serve the People: Medical Care in the People's Republic of China." *Asia*, v. 4 (Summer 1972), pp. 3-30.

Text of a talk at the Asia Society in Spring, 1972. Street health stations and "red guard doctors" delivery of neighborhood health care. Birth control and abortion. Integration of traditional and modern Western-type medicine: acupuncture anesthesia, Commune health stations. Production brigade health stations; barefoot doctors. Industrial medicine and occupational health. Sun Yat-sen Medical School.

143. Sidel, Victor W., "Some Observations on the Health Services in the People's Republic of China." *International Journal of Health Services*, v. 2 (1972), pp. 385-395.

The author presents a two part paper, based on personal observations, of health services in China. Part I describes the basic principles of current health services; part II describes practices in the organization of health services. He concludes that the Chinese have made incredible progress over the past 22 years and have many lessons for other countries.

144. Signer, Ethan, "Biological Science in China." *Science for the People*, v. 3 (September 1971), pp. 3-5, 15-19.

The author discusses current Chinese experiments with new ways to organize science and medicine. He asserts that the quality of most research is modest although there are significant exceptions such as synthesis of insulin and production of a birth control pill. It seems clear that Chinese research will emphasize applied research for a long time to come. Also, the policy of "walking on two legs" will take time to be truly assimilated.

145. Stanley, Margaret R., "Two Experiences of an American Public Health Nurse in China: A Quarter of a Century Apart." *American Journal of Public Health*, v. 63 (February 1973), pp. 111-116.

The author, a public health nurse who worked in China just prior to creation of the People's Republic focuses on health conditions over 30 years. She observes sharp improvements since 1946 and suggests that for the first time the Chinese society meets the basic ethical premise, Serve the People.

146. Wegman, Myron E., Lin, Tsung-yi., and Purcell, Elizabeth F., "Public Health in the PRC." New York: Josiah Macy Foundation (1973).

Report of a Conference Sponsored by the School of Public Health and the Center for Chinese Studies of the University of Michigan and the Josiah Macy, Jr., Foundation in 1972. This is a collection of papers dealing with various aspects of public health in China: health services, organization, popular participation, historical perspectives, health manpower, disease control, nutrition and population planning. Conclusion discusses present status and future perspectives.

NUCLEAR SCIENCE AND TECHNOLOGY

147. Clough, Ralph N., and others, *The United States, China, and Arms Control*. Washington, D.C.: The Brookings Institution (1975).

"The authors of this study consider whether Chinese nuclear weaponry is likely to affect the U.S.-Soviet strategic balance and analyze the possible influence of such weaponry on U.S. policies toward Japan and other East Asian countries. They examine Chinese attitudes toward arms control and outline a variety of possible approaches to agreements with China on arms control measures. They particularly emphasize the prospects for U.S.-Chinese negotiations focused on two proposals—reciprocal pledges by each nation not to be the first to use nuclear weapons against the other and international agreements concerning the Korean peninsula, including the establishment of a nuclear-free zone. In the author's view, the United States should in its own interest, seek to involve China soon in bilateral, private or official discussions on arms control."

148. Halperin, Morton H., *China and the Bomb*. New York: Frederick A. Praeger (1965).

Political and military implications of Chinese nuclear capability. Chapter 3 covers China's nuclear potential: Soviet nuclear assistance to China; Chinese development of nuclear weapons.

149. Kramish, Arnold, "The Great Chinese Bomb Puzzle—and a Solution." *Fortune*, v. 73 (June 1966), pp. 157-159, 250.

Attempt to reconstruct the technology which permitted rapid development of nuclear devices by the Chinese.

150. Minor, Michael S., "China's Nuclear Development Program." *Asian Survey*, v. 16 (June 1976), pp. 571-579.

A short history of China's nuclear development program is first given. Brief descriptions of the equipment and instruments, natural resources, and facilities necessary for nuclear development follows. A discussion of China's delivery systems program is also presented. Finally the author suggests several factors which might impede further nuclear development in China.

151. Murphy, Charles H., "China's Nuclear Deterrent." *Air Force Magazine*, v. 55 (April 1972), pp. 22-26.

Chinese People's Republic has made rapid progress in nuclear technology. This article includes extensive details of their strategic programs and an analysis of the political implications of China's nuclear deterrent.

152. Niu, Sien-chong, "Red China's Nuclear Might." *Ordnance Magazine*, v. 54 (January-February 1970), pp. 399-401.

Review of the nuclear development program by a "civilian government adviser to the Republic of China" on national defense matters. Soviet assistance to Chinese nuclear development. Organization of nuclear research: the Institute of Atomic Energy; Chinese participation in research at Dubna—"Through this arrangement the Soviets could siphon off the efforts of the best Chinese and East European nuclear physicists." Technology of the Chinese nuclear explosions. The Cultural Revolution.

153. Pollack, Jonathan D., "Chinese Attitudes Toward Nuclear Weapons, 1964-69." *China Quarterly*, no. 50 (April-June 1972), pp. 244-271.

Using content analysis of military and leadership statements, the author concludes that the Chinese nuclear capability was developed more from a sense of perceived external threat than a desire for aggression. He argues that the Chinese attitude towards nuclear weapons during this period was dependent upon their perception of foreign policy constraints.

154. Rifkin, Susan Beth, "The Development and Use of Nuclear Energy in the People's Republic of China." *IR&T Nuclear Journal*, v. 1, nos. 4 and 5 (1969), pp. 1-24 and 1-13.

By developing atomic energy, China has gained a technological base for a new source of energy for civilian and military purposes; created a weapons program that has commanded world attention; and proved that China's approach can be used to bring a non-industrial country to the threshold of a modern industrial and military capability in a short time. . . . Discusses the foundations of nuclear program, Soviet assistance, and Chinese nuclear weapons development.

155. Wang, Chi, "Nuclear Research in Mainland China." *Nuclear News*, v. 10 (May 1967), pp. 16-20.

Following description of initial development of nuclear research facilities with Soviet aid, presents organization of research facilities at the Academy of Sciences and its branches; application of atomic energy in agricultural and medical sciences; availability and training of manpower; nuclear research publications. Conclusion: "nuclear research in Mainland China has passed the embryonic stage and more rapid advances may now be anticipated."

156. Wang, Chi, *Nuclear Science in Mainland China, A Selected Bibliography*. U.S. Library of Congress, Washington, U.S. Government Printing Office (1968).

Pt. I—Items in Chinese by Chinese scientists and engineers; results of original research; some review and "current awareness" articles. Pt. II—Items from scientific journals, leading periodicals, and news magazines published chiefly in the U.S., Japan; also English translations of Chinese materials and English-language publications in China. Review articles relating to the development and potential of China's nuclear program.

157. Yahuda, Michael B., "China's Nuclear Option." *Bulletin of the Atomic Scientists* (February 1969), pp. 72-77.

Deals with several aspects of China's achievements in the development of a nuclear program. First, the author suggests a number of reasons for China's adherence to nuclear doctrine. Second, Chinese views on the role of nuclear weapons are discussed. Third, the author maintains that China has not yet become a participating member of the international community. However, Chinese deployment of a strategic deterrence policy would serve to engage the nation in more extended international interactions.

ECONOMICS AND INDUSTRY

158. Albertson, Maurice L., "Impressions of the People's Republic of China, From Ideology to Action." *Mechanical Engineering*, v. 97 (March 1975), pp. 48-49.

Several principles of Maoist philosophy are discussed. On the basis of these principles, "the Chinese people are exhorted to modernize agriculture, rebuild their forests, generate hydro-power, erect powerlines, found small and large industries, build roads, construct buildings, and much, much more."

159. Audors, Stephen P., "Revolution and Modernization: Man and Machine in Industrializing Society." In: Friedman, Edward and Selden, Mark. *America's Asia*. Pantheon (1971), pp. 393-444.

Discusses contemporary China as both a modernizing and industrializing society. The author focuses on factory management in Chinese industrial enterprises to show that what is revolutionary need not be irrational or inefficient. He concludes that the Chinese approach is more than one of management and is a national movement.

160. Chao, Kang, *The Construction Industry in Communist China*. Edinburgh, Edinburgh University Press (1968).

Discusses strengths and weaknesses of China's construction industry and its relation to economic growth. Includes scope and organization, output and inputs and technological aspects. The main weakness of construction has been its low technical level.

161. Cheng, Chu-yuan, *The Machine Building Industry in Communist China*. Edinburgh, Edinburgh University Press (1972). Also: "Growth and Structural Changes in the Chinese Machine-Building Industry." *The Chinese Quarterly*, no. 41 (January-March 1970), pp. 26-57. Also: "The Effects of the Cultural Revolution on China's Machine-Building Industry." *Current Scene*, v. 8 (January 1970), pp. 1-15.

"The fundamental object of this study is to present a comprehensive picture of the machine-building industry in China: demand and supply, imports and exports, growth rates in gross and net output value, input-output relationships, changes in output composition, and the industry's contribution to national goals. . . ." Compar[es] . . . China's achievements in the machine-building industry from 1952 to 1966 with those in advanced countries in terms of . . . technical levels. "The Chinese industry is technologically far behind the advanced countries" . . . in number of types of machinery produced, capacity of machinery produced and in degree of precision.

162. "China: Design by Group Thought and Construction." *Engineering News-Report* (February 28, 1974), pp. 24-25.

A Los Angeles architect finds marked differences between Chinese architectural practices and those of Western countries. Each architect is encouraged to contribute thoughts on a project to his leader; everyone's ideas are deemed important. Students in construction and architectural school must perform two years of work before enrollment. "The disdain for experts, the humility demanded from project leaders, the seeking of technical solutions from levels of labor, and the tremendous desire to get things done" are all part of the Chinese architectural method.

163. Clark, M. Gardner, *The Development of China's Steel Industry and Soviet Technical Aid*. Ithaca, New York, Cornell University (1973).

"This is the first in-depth study of the steel industry of Communist China. It is valuable not only for what it tells of this key economic sector, but . . . because it mirrors that nation's progress toward economic development in general." The book describes Soviet aid to China's steel industry from 1950-1957, contrasting this period with post-1957 and the technological pattern later developed.

164. Craig, Jack, "China: Domestic and International Telecommunications, 1949-74." In: U.S. Congress, Joint Economic Committee, *China: A Reassessment of the Economy*. Washington, U.S. Government Printing Office (1975), pp. 289-310.

China has fulfilled her basic needs for long-range development of a domestic telecommunications system and has made much progress in international telecommunications. Total capability, however, is not comparable to Western telecommunication systems. A review of all aspects of the development of China's telecommunications system.

165. Daily, James, W. Dr., "Impressions of the People's Republic of China, Industry in a Planned Society." *Mechanical Engineering*, v. 97, no. 7 (July 1975), pp. 24-25.

"What is China's industry like today?" In answering this question, the author describes two representative Chinese industries, the Canton Machine Works and Shanghai Machinery Works. The availability of consumer goods is also discussed.

166. Dalyell, Tam "Chemical Industry in China Today." *Chemistry & Industry*, no. 1 (January 1, 1972), pp. 10-11.

The author's observations of the Shanghai chemical plant. Production processes: production of sulphuric acid for fertilizer production; coal is the basis for production of ammonia and methanol; new drying rotary kiln for the urea process; conversion of sulphur dioxide into sulphuric acid using "crudish" form of water spraying. Organization of the plant: 5 main workshops, 3 auxiliary workshops, maintenance workshop. Levels of output employment. Innovations on display at the Shanghai Industrial Exhibition. China as an exporter of technology. Efforts to control pollution, urban drift.

167. Grossman, Bernhard, "International Economic Relations of the People's Republic of China." *Asian Survey*, v. 10 (September 1970), pp. 789-802.

The author adopts the theory that there are both political and economic objectives behind the foreign trade of the People's Republic of China. Thus, he addresses three questions: "1) does Chinese politics influence foreign trade, 2) can foreign trade and aid be used by China to pursue a certain policy, 3) can Chinese foreign trade be used as an indicator of political development in China?"

168. Grzybowski, Kazimierz, (ed.), "Trade with China," *Law and Contemporary Problems*, v. 38 (Summer-Autumn, 1973), entire issue.

"This symposium concentrates on providing information regarding China's foreign trade with the free economy countries of the United States, Canada, Holland, and Japan. The issue covers such matters as techniques of trade, Chinese foreign trade organization, and the legal regime of foreign trade transactions in the People's Republic of China."

169. Kraar, Louis, "I Have Seen China—And They Work." *Fortune*, v. 86 (August 1972), pp. 111-117, 210, 212.

Observations from the author's visit to China. . . . Description of technology in county industries, household factories and co-operatives in Canton, Kwangchow Bicycle Plant. "At every level, China mobilizes its abundant resources of labor . . . to compensate for a scarcity of capital." Factory management, technical organization at Kwangchow Heavy Machine Tool Plant. Production of agricultural equipment and machinery in Shunte County, Kwangtung.

170. Meisner, Mitch, "The Shenyang Transformer Factory—A Profile." *China Quarterly*, no. 52 (October-December 1972), pp. 717-737.

A profile of a transformer factory is presented by a member of the Committee of Concerned Asian Scholars' Second Friendship Delegation. "It is true that there have been and will continue to be struggles and conflict around the mass-cadre contradiction. But, in the Shenyang Transformer Factory, where the cadres seemed powerful and impressive people, the workers also appeared to be pretty 'together' people in their own right. And the factory was working as a united community."

171. Richman, Barry M., *Industrial Society in Communist China; A First Hand Study of Chinese Economic Development and Management*. Random House, New York (1969).

A multidisciplinary approach to industrial management and economic development; central thesis is that effective and efficient enterprise management is the key to industrial progress and general economic development. Data derived from two month visit to China in 1966 . . . Conclusion: very few poor countries have done as well in economic growth or industrialization as

China has since 1950, but China's fulfillment of her potential depends chiefly on whether ideological extremism or managerial, technical and economic rationality prevails.

172. Riskin, Carl, "Small Industry and the Chinese Model of Development," *The China Quarterly*, no. 46 (April-June 1971), pp. 245-273.

"... Examines the evolution and implementation of China's policy towards small and medium industry ... delineates the relation between small industry and the general development problem in China, and ... (attempts) to gain ... insight into the nature and logic of (this) particular strategy of development (which is) associated with Mao ... " Principal tenets of the small-industry policy today: (a) to build 'small but comprehensive' and relatively self-sufficient industrial systems of dispersed factories operated and controlled by the various localities themselves; (b) to link such systems with the need of agriculture; and thereby (c) to raise labor productivity in agriculture by means of innovation and technological change, including mechanization."

173. Scott, David, "China Opens Doors for Rare View of Auto Production," *Automotive Engineering*, v. 82 (August 1974), pp. 30-33.

Discusses the slowly developing auto industry in China which is based on self-reliance more than on the technology of advanced nations. In spite of the modest growth to date the author asserts, "... there is still interest in obtaining high-technology equipment and know-how from the outside world."

174. Sigurdson, Jon, "Factories in the Fields." *China Now*, no. 23 (1972), pp. 5-6.

Descriptive analysis of country-level industrial network geared to serve agriculture. Social implications of diversification of rural economy. Indigenous technology and self-reliance in rural industries; adaptation of technology from the cities.

175. Sigurdson, Jon, "Rural Industrialization in China," In: U.S. Congress, Joint Economic Committee. *China: A Reassessment of the Economy*. Washington, U.S. Government Printing Office (1975), pp. 411-435.

Rural industrial sector in China consists of enterprises which vary greatly in size and in degree of technological sophistication. Although the development of rural industries may have sacrificed economic growth in the short run, in the long run it is likely to contribute to a more rapid economic growth than would otherwise have been possible.

176. Sigurdson, Jon, "Rural Industry—A Traveler's View." *The China Quarterly*, no. 50 (April-June 1972), pp. 31-32.

Observations from the author's visit in December 1971 to some 20 small industrial enterprises in two counties, in Hopei and Honan. Agricultural mechanization. Building local industry: the

pilot plant approach; diversification; interdependence of enterprises; indigenous equipment and innovations; management. Three objectives of rural industrialization: acceleration of development of industry; geographical distribution of industry; promotion of technology and research suited to China's conditions.

177. Usack, Alfren H. Jr., and James D. Egan, "China's Iron and Steel Industry." in: U.S. Congress, Joint Economic Committee. *China: A Reassessment of the Economy*. Washington, U.S. Government Printing Office (1975), pp. 264-288.

Review of the raw materials base, the development of the steel industry, and current state of the industry. Discusses obstacles to reach balance and reduce dependence on outside world. China is likely to initiate a strong investment push in the iron and steel industry.

178. U.S. Congress. Joint Economic Committee, *People's Republic of China: An Economic Assessment; A Compendium of Papers*, 92d Congress, 2d session. Washington, U.S. Government Printing Office (1972), 382 p.

A collection of papers dealing with various aspects of science, technology and the economy in China through and immediately following the Cultural Revolution.

179. U.S. Congress. Joint Economic Committee. *China: A Reassessment of the Economy: A Compendium of Papers*. 94 Congress, 1st session. Washington, U.S. Government Printing Office (1975), 738 p.

A collection of papers dealing with science, technology as well as the economics of China. Individual papers are cited and annotated throughout this bibliography.

180. Wang, K. P., *The People's Republic of China—A New Industrial Power With a Strong Mineral Base*. Washington, U.S. Bureau of Mines (1975).

"Chinese mineral developments, especially petroleum, have been increasingly in the news. Oil and gas may have great potential, but a very large coal industry is already in existence. The steel industry ranks fifth or sixth in the world. The PRC is also prominent in fertilizer, cement, and salt production. The export metals are well known. Also, the country is buying heavily in non-ferrous base metals. The need to know and the intense interest in the subject have prompted this study."

"The world significance of Chinese minerals is pointed out. The history of growth and PRC's mineral supply position are reviewed. Evaluations are made of policy considerations and regional and technical factors affecting mineral development. PRC's mineral trade and efforts to obtain equipment supplies, and know-how are assessed. Specific reviews are made of major

mineral sectors, including coal and power, oil and gas, iron and steel, nonferrous metals, industrial minerals, and fertilizers and chemicals. The overall outlook is summarized."

181. Young, C. B. W., "Red China." *Chemical Engineering Progress*, v. 61 (December 6, 1965), pp. 37-40.

The chemical industry in 1949; growth of the chemical industry since 1949: production increase, 1953-57; industry expansion, 1958-1964; related foreign trade; current technical status of the chemical industry. Concludes that there is a very promising outlook for the technical status of the chemical industry in the near future, especially because of the acquisition of technical know-how which is to accompany the chemical plants from Western Europe and Japan.

EDUCATION AND MANPOWER

182. Bugliarello, George, "Impressions of the People's Republic of China, Engineering Education." *Mechanical Engineering*, v. 97 (April 1975), pp. 28-29.

In 1949, all Chinese educational institutions became subject to Communist philosophy. The author discusses the many changes in the educational system which have been instituted since that year. While the present Chinese educational system holds several positive aspects, the author suggests that "the high degree of ideological conformity and an exclusively practical orientation in research may severely effect China's ability to produce innovations at the high rate necessary for continuous progress in an advanced technological country—the kind of country that China aspires to be."

183. Cheng, Chu-yuan, *Scientific and Engineering Manpower in Communist China 1949-1963*. National Science Foundation Publication No. NSF 65-14 (1965).

A detailed analysis of Chinese data relating to that country's scientific and engineering manpower. Includes such topics as policy and planning for scientific development; quality and quantity in the training of scientists and engineers; employment and utilization of scientists and engineers; role of Soviet Union and western trained scientists. Concludes that despite a setback during 1960-63, China has made substantial progress in the fields of science and technology.

184. Cheng, Chu-yuan, "Scientific and Engineering Manpower in Communist China." In: U.S. Congress, Joint Economic Committee. *An Economic Profile of Mainland China*, Washington, U.S. Government Printing Office (1968), pp. 519-547.

Investigates the training and employment of Chinese scientific and engineering manpower between 1949 and 1964. Although the number of scientists and engineers has increased rapidly, the emphasis on "readiness" over "expertness", overspecialization, and shortcomings with respect to the employment and utilization of these specialists has resulted in many basic weaknesses.

185. Christiansen, W. N., "Science and the Scientist in China Today." *Eastern Horizon*, v. 7 (March-April 1968), pp. 36-40.

Brief review of history of Chinese science and technology; Russian influence on Chinese higher education and scientific research. Effect of Russian withdrawal. Science subordinate to political goals. Reform of scientists.

186. Galston, Arthur W., "No Grades, No Tests." *Yale Alumni Magazine*, v. 35 (April 1972), pp. 8-11.

General observations of changes in the education system of

China, observed by the author on his 1971 visit to China. Brief description of biology department at Chungshan University. "... there is essentially no basic research going on in China now ..." but the Chinese recognize the ultimate necessity of returning to basic research when their physical conditions permit this to be done."

187. Galston, Arthur W., "The University in China." *Bioscience*, v. 22 (April 1972), pp. 217-220.

The university in the post-Cultural Revolution People's Republic of China is unrecognizable from its American counterpart. The author discusses the university structure in the PRC and the changes that have occurred since the Cultural Revolution.

188. Galston, Arthur W., and Signer, Ethan, "Education and Science in China." *Science*, v. 175 (January 7, 1972), pp. 15-23.

The first two American scientists to visit the People's Republic of China in over twenty years discuss the changes in science education. "Science is conceived of as a collective group activity, in which theory and practice must always be united to serve production." The most far reaching reform is the elimination of elitism from scientific, technical and intellectual activity.

189. Jen, C. K., "Science and the Open-Doors Educational Movement." *The China Quarterly*, no. 64 (December 1975), pp. 741-747.

The present open-doors educational movement is a natural product of the two successive phases of the Cultural Revolution: the Great Proletarian Cultural Revolution and the campaign to criticize Lin Biao and Confucius. The whole movement aims at complete integration of the schools with all other components of society like the communes, factories, research institutes, etc. While each part of society still keeps its own identity, it throws its doors wide to facilitate a reciprocal, free and unlimited access to other components, so that all parts of society work together for the common goal.

190. Martin, Charles M., "China: Future of the University." *Bulletin of the Atomic Scientists*, v. 25 (January 1971), pp. 11-19.

During the Cultural Revolution the universities in China were closed for a period of four years. Since they have reopened there has been debate over curriculum and democratization of the school. The author compares such difficulties with those currently confronting many American universities.

191. Martin, David, "China Today." *Chemistry in Britain*, v. 8 (August 1972), p. 533.

Brief note on the visit of the executive secretary of the Royal Society to the Academia Sinica Institute of Chemistry, and to Peking National University, including the biochemical department, in May 1972. "The visit to the Institute of Chemistry revealed the same pattern as elsewhere—a revolutionary committee in charge and a program devoted to applied work ... close cooperation between the Institute and the factories with frequent interchange of personnel."

192. Orleans, Leo A., "How the Chinese Scientists Survives." *Science*, v. 177 (September 8, 1972), pp. 864-866.

Surveys the impact of the Cultural Revolution on Chinese scientists and concludes that Chinese science and technology seem to be none the worse for it. Asserts that the Chinese people are masters at enduring adversity as exemplified by their survival during the Cultural Revolution.

193. Orleans, Leo A., *Professional Manpower and Education in Communist China*. National Science Foundation, Publication No. NSF 61-3 (1961).

II—Educational policies and problems. III—Primary and secondary education. IV—Higher education. V—Quality of education. VI—Science and technology. VII—Professional manpower. VIII—Survey of the population and labor force. Appendices include: C—Institutions of higher education. D—Institutions offering postgraduate courses. E—Specializations in higher technological institutions. I—Scientific research institutes in China.

194. Schnarch, Alexander, "R&D Policy in China After the Cultural Revolution." *Research Management*, v. 19 (January 1976), pp. 28-32.

The author focuses on the immediate effects of the Cultural Revolution on China's industrial and educational sectors. "The problems related to the ties between industry and the universities have been extensively studied and some original experiments have been performed. A number of technical universities are operated by industries themselves while universities operate their own factories. Teaching, production, and scientific research are integrated with one another." The author suggests that such institutional changes hold implications for each aspect of Chinese society.

195. "Scientists Go Barefoot." *Survival*, v. 13 (July 1971), pp. 232-238.

"Scientific and technological progress in China, which in the past years has reached remarkable levels, is achieved not just through the efforts of the elite, but also with the participation of the masses. In other words, China is trying to overthrow the classic method of communicating know-how and to start from the bottom instead of from the top."

196. Sharp, Ilsa, "No Ivory Towers." *Far Eastern Economic Review*, v. 72 (June 5, 1971), pp. 64-66.

A new pattern in the educational system in China is emerging after the Cultural Revolution. Impressions based on the author's visit to China, chiefly Chungshan University. "Chungshan University's curriculum shows a strong bias towards applied sciences. . . . The departments have been revamped to cover study in electronics, biology, synthetic materials, optics, dynamics, rare metals, politics, geography and Chinese. . . . The casualties of the Cultural Revolution were the departments of physics, math, chemistry, foreign languages and philosophy."

197. Swetz, Frank, "Training of Mathematics Teachers in the People's Republic of China." *American Mathematical Monthly*, v. 77 (December 1970), pp. 1097-1103.

The present principal influence in Chinese education is the Communist Party and its doctrines as set forth in the writings of Chairman Mao Tse-tung. . . . In the sphere of education, 'walking on two legs' has resulted in the formation of numerous spare-time and part-time schools at various levels to supplement the expanded regular school system. . . . Despite the existence of these bogus 'schools,' there are many types of bona fide education institutions in existence in the People's Republic of China. . . . The burden of supplying trained teachers for these schools has fallen upon the traditional training institutions.

198. Unger, Jonathan, "Mao's Million Amateur Technicians." *Far Eastern Economic Review*, v. 72 (April 3, 1971), pp. 115-118.

"Publicity accorded model counties, factories, communes and production brigades in the Chinese press "provide glimpses of the means by which the Chinese disperse technical knowledge and co-ordinate their innumerable industrial schemes into a coherent whole." Themes include "initiative and technical leadership by unlettered workers; "self-reliance" and thrift by model factories and remarkable technical advances by small under-capitalised plants." Case studies of worker innovations drawn from the Chinese press.

199. Yang, Chen-ning, "Education and Scientific Research in China." *Asia*, No. 26 (Summer 1972), pp. 74-84.

Visits to three research institutes of the Chinese Academy of Sciences in 1971: Institutes of Biochemistry, Physiology and Nuclear Physics. Reevaluation of research programs since the Cultural Revolution. Basic research will not have priority in education programs. Scientific publication and communication.

SCHOLARLY EXCHANGE

200. Abarbanel, Henry, "The New China Hands—American Scientists Visit the People's Republic." *Engineering and Science*, v. 37 (February 1974), pp. 14–28.

Based on observations made during a visit to China, an admittedly 'new hand' at China watching comments on the impressive state of Chinese science. He notes the healthy, well fed appearance of the people; but states that visits to science facilities were more formal than informative. In spite of apparent enthusiasm for the state of development he observes the lack of privacy, social pressure and comrade persuasion would probably be unacceptable to most Americans.

201. *Acupuncture Anesthesia in the People's Republic of China: A Trip Report of the American Acupuncture Anesthesia Study Group*. National Academy of Sciences, Washington, D.C. (1976).

The delegation visited 16 hospitals and observed 48 operations performed under acupuncture anesthesia. The report includes an evaluation of each operation observed, and discusses the effectiveness of acupuncture in controlling operative pain and factors affecting the success of acupuncture hypalgesia. It also discusses the implications of acupuncture hypalgesia for Western surgery and describes Chinese and Western research efforts with acupuncture.

202. Balderose, George, and Fitzgerald, Anne, "Science and the People's Republic of China." Report of Conference sponsored by the National Committee on U.S.-China Relations and the Committee on Scholarly Communication with the People's Republic of China of the National Academy of Sciences in Cooperation with the Johnson Foundation. (May 29–31, 1973), Washington, National Academy of Sciences, 26 p.

The conference underlines the role which science can play in international communication and cooperation. The participants agreed that we have much to learn about organization and administration of science in China.

203. Brown, Harrison, "Scholarly Exchanges With the People's Republic of China." *Science*, v. 183 (January 11, 1974), pp. 52–54.

The Foreign Secretary of the National Academy of Sciences describes the program of scholarly exchanges with the People's Republic of China. The Committee on Scholarly Communication with the People's Republic of China, formed in 1960, stresses the mutual benefits of these exchanges. Nine of twelve proposed American study teams to China are discussed.

204. Cooper, Gene, "An Interview With Chinese Anthropologists." *Current Anthropology*, v. 14, no. 4 (October 1973), pp. 480-482.

Members of the Committee of Concerned Asian Scholars and three Chinese anthropologists discuss their respective views on anthropological study. The author maintains that cultural anthropology has been "repudiated as a discipline; the focus of Chinese anthropological study is archeological work. The Chinese scholars assert their views on the "discipline"; the changes of the past 30 years in China enable us to understand how to change the field of anthropology and to use our knowledge to serve the people and not to serve imperialism.

205. Davis, Chandler, "A Mathematical Visit to China." *Canadian Mathematical Conference Bulletin*, (Fall 1971), pp. 2-3, 5, 7-8.

Based on the author's 1971 visit to the Mathematics Institute (CAS), Peking University, and Fudan University. Experiences of individual Chinese mathematicians during the Cultural Revolution. Research in applied mathematics predominates. University teaching of mathematics, and popularization of mathematical techniques, such as linear programming or critical-path method. There is nothing corresponding to graduate education in mathematics. Preparation for a 'resurgence of theory' by writing 'summaries' of mathematics. Publication. Western mathematical journals are received and used.

206. "Earthquake Research in China." *EOS*, v. 56 (November 1975), pp. 838-881.

This is a detailed account of a month-long visit to China in October 1974 by the CSCPRC Seismology Delegation, led by Frank Press, Chairman of the Department of Earth and Planetary Sciences, MIT. It includes information on China's national earthquake program; Chinese universities and institutes where seismological studies are in progress; geophysical instrumentation and observatories; seismotectonics in China; historic records of Chinese earthquakes; premonitory effects of earthquakes; statistics, models, and theory; rock mechanics; earthquake engineering; and the history and politics of earthquake studies.

207. FitzGerald, Anne, and Slichter, Charles P. (eds.), *Solid State Physics in China: A Trip Report of the American Solid State Physics Delegation*. National Academy of Sciences, Washington, D.C. (1976).

In September 1975 a delegation of solid state physicists, led by Charles Slichter, Professor of Physics at the University of Illinois, visited China. The group's goal involved a better understanding of both present Chinese research and the Chinese educational activities in solid state physics.

208. *Herbal Pharmacology in the People's Republic of China: A Trip Report of the American Herbal Pharmacology Delegation*. National Academy of Sciences, Washington, D.C. (1975).

Based on a month-long visit by the American Herbal Pharmacology Delegation, this report surveys current Chinese approaches to the use of basic and clinical herbal medicines for

a variety of illnesses and diseases, viewed within the political and social framework of the country. A special section contains analyses of 248 commonly used plant and animal drugs and the extent to which the success of each herbal prescription has been documented in the literature. The volume also assesses the status of Chinese pharmaceutical research, education, and drug control.

209. Kessen, William (ed.), *Childhood in China*. Yale University Press, New Haven and London (1975).

In November 1973 eleven specialists in child development visited kindergartens, primary schools, and middle schools in China. This report of their visit highlights interviews with children, teachers, educational administrators, and parents in 28 schools throughout China and makes observations on formal curriculum, social and personality development, teaching practices, and on patterns of the child's interactions with peers and adults.

210. Lehmann, Winfred, P. (ed.), *Language and Linguistics in the People's Republic of China*. University of Texas Press, Austin and London (1975).

This volume reflects the findings of ten linguistic scholars who visited China approximately one year after a group of Chinese language teachers visited the United States. The topics covered include: the common language and the language of everyday life; language reform; the teaching of Chinese; the teaching of English and other foreign languages; lexicography; language pathology; experimental research; the national minority languages; and language theory in the People's Republic of China. There is also a list of the itinerary and the people whom the group met in China.

211. Loewe, Michael, "Archaeology in the New China." *The China Quarterly* (March 1976), pp. 1-14.

Brief review of the history of archaeology in China; new developments in Chinese archeological practices are also presented. The author suggests in infusion of Maoist political ideology into interpretations of both history and archeological finds.

212. Lubkin, Gloria B., "Physics in China." *Physics Today*, v. 25 (December 1972), pp. 23-28.

Summary of reports from seven U.S. physicists who recently visited China. Organization, research programs, equipment, as observed at: Institute of Physics, Chinese Academy of Sciences; Peking University; Tsinghua University; Fudan University; Shanghai Industrial Exhibit; Institute for Computer Research; Institute of Semiconductors, CAS; Institute of Electronics, CAS; Miyua Observatory; Purple Mountain Observatory; University of Nanking; Mechanics Research Institute, CAS; Institute of Nuclear Physics, CAS. Research in astronomy and fluid mechanics; nuclear physics; high-energy physics. Scientists interviewed include Marvin Goldberger, C. K. Jen, Rudolph Hwa, Raphael Tsu, Chen Ning Yang, C. C. Lia, Chang-Yun Fan.

213. *Plant Studies in the People's Republic of China: A Trip Report of the American Herbal Pharmacology Delegation*. National Academy of Sciences, Washington, D.C. (1975).

This report draws on numerous visits to communes and agricultural institutions and extensive discussions with Chinese agricultural professionals by members of the American Plant Studies Delegation. It surveys Chinese crop varieties, diseases, and multiple cropping systems, along with research centers and regions of the country where certain crops are grown. Specific crops covered include the major cereals, soybeans and other grain legumes, vegetables and fruits, pasture and forage crops, cotton, and forest growths. The result is a study of the status and organization of Chinese scientific and technical work in the plant sciences.

214. Whalley, Jr., Stephen, "Prospects for Sino-American Scholarly Exchange." In: Gene T. Hsiao (ed.) *Sino-American Detente and Its Policy Implications* New York: Praeger Publishers (1974), pp. 84-96.

The author discusses both the possible impediments to and the further opportunities for future Sino-American scholarly exchanges. He concludes that such new U.S. attitudes towards China as "open-mindedness and receptivity" will improve chances for scholarly exchange between the two nations.

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